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What is claimed is:

1. A non-aqueous electrolyte comprising a pyridinium-based salt in a non-aqueous solvent at a concentration less than 2M.

2. The electrolyte of claim 1, wherein the pyridinium-based salt consists of a pyridinium cation and a perfluorinated non-metal anion.

3. The electrolyte of claim 2, wherein the perfluorinated non-metal anion is selected from the group consisting of perfluorinated boron, perfluorinated phosphorous, perfluorinated sulfur, perfluorinated arsenic, perfluorinated antimony, perfluoroalkylborates, perfluoroalkylphosphates, perfluoroalkylsulfonates, perfluoroalkyl-substituted imides and perfluoroalkyl-substituted methanides.

4. The electrolyte of claim 3, wherein the perfluorinated non-metal anion is tetrafluoroborate.

5. The electrolyte of claim 1, wherein said organic solvent is selected from the group consisting of linear ethers, cyclic ethers, esters, carbonates, formates, lactones, nitriles, dinitriles, amides, sulfones and sulfolanes.

6. The electrolyte of claim 5, wherein said organic solvent is selected from the group consisting of propylene carbonate, acetonitrile and gamma butyrolactone.

7. The electrolyte of claim 1, wherein said pyridinium-based salt is dissolved in said organic solvent at a concentration of less than 1.75 M.

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8. The electrolyte of claim 1, wherein said electrolyte has a voltage window of at least 3 volts.
9. The electrolyte of claim 1, wherein said electrolyte has a voltage window of at least 3.5 volts.
10. The electrolyte of claim 1, wherein said electrolyte comprises an additional salt.
11. The electrolyte of claim 10, wherein said additional salt is a tetraalkylammonium or tetraalkylphosphonium salt having perfluorinated anion.
12. The electrolyte of claim 10, further comprising an additional non-aqueous solvent.
13. The electrolyte of claim 1, further comprising an additional non-aqueous solvent.
14. An electrical energy storage device comprising a non-aqueous electrolyte comprising a pyridinium-based salt in a non-aqueous solvent at a concentration less than 2M.
15. The electrical energy storage device of claim 14, wherein said pyridinium-based salt is dissolved in said organic solvent at a concentration of less than 1.75 M.
16. The electrical energy storage device of claim 14, wherein the perfluorinated non-metal anion is selected from the group consisting of PF₆⁻, AsF₆⁻, BF₄⁻.
17. The electrical energy storage device of claim 16, wherein the perfluorinated non-metal ion is tetrafluoroborate.

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18. The electrical energy storage device of claim 14, wherein said organic solvent is selected from the group consisting of linear ethers, cyclic ethers, esters, carbonates, formates, lactones, nitriles, dinitriles, amides, sulfones and sulfolanes.

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19. The electrical energy storage device of claim 18, wherein said electrolyte comprises a non-aqueous solvent selected from the group consisting of propylene carbonate, acetonitrile and gamma butyrolactone.

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20. The electrical energy storage device of claim 14, further comprising carbon-based electrodes.

21. The electrical energy storage device of claim 14, wherein said electrolyte has a voltage window of at least 3 volts.

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22. The electrical energy storage device of claim 21, wherein said electrolyte has a voltage window of at least 3.5 volts.